Finding fortune in the forest

A case study of social vulnerability in Núi Thành District, Vietnam

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Finding fortune in the forest:

A case study of social vulnerability

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Abstract

The main objective of this dissertation is to examine the ways in which planned intervention and other external drivers have engendered livelihood changes and influenced the social vulnerability of local people to future stresses and shocks in an upland area of central Vietnam. In addition, the dissertation assesses the extent to which these planned interventions have achieved the outcomes anticipated by the Government of Vietnam and its donors and partners, and seeks to explain unintended consequences of these interventions. This goal is pursued by addressing a set of research questions contained within each of the four research papers that form the core of the dissertation. All four papers deal with the effect of various drivers on livelihoods in an upland setting. These drivers include programmes for land allocation and reforestation conceived and rolled out by the central government, and natural hazards such as typhoons and drought.

The dissertation has sought to analyse which social actors have proven themselves to be less vulnerable and more resilient in a setting characterized by a complex history of responding to multiple stress and shock factors. The implementation of large-scale national programmes has had a number of unintended consequences that have left parts of the population in the study area increasingly vulnerable to both market forces and natural hazards. These include the reinforcement of existing social inequality, uncontrolled extraction of valuable tree species, unregulated and arbitrary replacement of natural forest with production forest, and the increasing dependence of the poorest households on casual labour as a short-term and unstable source of income. Many households continue to rely on agriculture for the bulk of their income. However, recurring droughts, poor soils and lack of investment have left them vulnerable and unable to claim forest land, since most of the land has already been acquired. Those who made early investments in production forestry have benefitted immensely and have been able to consolidate forest land by purchasing additional land, often from ethnic minority households. These ‘early investor’ households are more resilient in the face of change, given that they have more diversified livelihood portfolios, often as middlemen in wood supply chains or as small businesses owners. Despite the ability of some households to diversify their livelihoods, engagement at various stages of the wood supply chain provides the sole source of income for the majority. From a resilience perspective, this is problematic, since the lack of diverse income sources will leave households unable to absorb a market shock or a natural hazard.

Despite making strides towards devolution and greater participation of local communities in local development processes, people in the study area have been guided overwhelmingly in their decision-making by the government, which has used a technocratic and top-down approach. In the study area, this has arguably been at the expense of full transparency and the genuine involvement of the people who are directly affected by these interventions. This has led to uncertainties in the interpretation of requests handed down by higher levels of government and has in some cases caused communities to devise innovative strategies for bending or breaking the rules in order to ensure their food security and a decent level of well-being.

Resumé

Formålet med denne afhandling er at undersøge, hvordan eksterne interventioner har påvirket lokalbefolkningens livsbetingelser og sårbarhed overfor fremtidige stress- og chokfaktorer i et bjergområde i det centrale Vietnam. Desuden vurderer afhandlingen i hvilket omfang disse interventioner har opnået de resultater som Vietnams regering samt donorer og partnere forventede, samt søger at forklare eventuelle utilsigtede konsekvenser af disse interventioner. For at gøre dette, svarer afhandlingen på et sæt forskningsspørgsmål indeholdt i de fire artikler, som udgør kernen i afhandlingen. Alle fire artikler omhandler effekten af disse forskellige drivkræfter for forandring på levevilkår i bjergområdet. Disse drivkræfter omfatter udviklings-, jordfordelings- og skovprogrammer udtænkt og implementeret af staten samt naturlige processer som tyfoner og tørke.

Afhandlingen analyserer, hvilke sociale aktører der har vist sig at være mindre sårbare og mere modstandsdygtige i et område med en kompleks historie karakteriseret af flere stress- og chokfaktorer. Gennemførelsen af store nationale programmer har haft en række ofte utilsigtede konsekvenser, som har gjort at store dele af befolkningen i undersøgelsesområdet i stigende grad er sårbare overfor både markedskræfter og naturkatastrofer. Disse konsekvenser omfatter en forøgelse af den eksisterende sociale ulighed, ureguleret fældning af værdifulde træarter, vilkårlig og ureguleret erstatning af naturlige skovarealer med plantede produktions-orienterede skove samt stigende afhængighed blandt de fattigste befolkningsgrupper af kortfristede og ustabile indtægtskilder, primært fra 'casual labor'. Mange husstande er fortsat afhængige af landbrug, som bidrager med størstedelen af deres indkomst, men tilbagevendende tørke, dårlige jordforhold og manglende investeringer har gjort dem sårbare og ude af stand til at etablere produktions-orienteret skovbrug, da det meste af jorden allerede er udstykket. De husstande som har investeret i produktions-orienteret skovbrug tidligt, har haft stor gavn heraf og har kunnet konsolidere skovarealet ved at købe ekstra jord, ofte fra etniske minoriteteter. Disse tidlige investorer er mere modstandsdygtige, da de har mere diversificerede livsbetingelser og ofte ejer små virksomheder eller abejder som mellemmænd i træforsyningskæder. På trods af nogle husstandes evne til at diversificere deres indkomstkilder, er de fleste engageret på forskellig vis i diverse led i træforsyningskæden. Dette kan være problematisk, da manglen på varierede indkomstkilder vil påvirke husholdningers evne til at modstå eksterne stress- og chokfaktorer.

På trods af fremskridt med decentralisering og større deltagelse af civilbefolkningen i lokale udviklingsprocesser er beslutningstagningen i undersøgelsesområdet styret primært af centralregeringen, som anvender en teknokratisk og top-down tilgang. Dette har sandsynligvis været på bekostning af transparens og ægte inddragelse af de mennesker, der er direkte berørt af eksterne interventioner. Det har også medført usikkerhed i fortolkningen af direktiver fra højere regeringsniveauer og har i nogle tilfælde tvunget lokalbefolkningen til at udforme innovative strategier til at bøje eller bryde reglerne for at skaffe dem fødevaresikkerhed og anstændige levevilkår.

Contents

"The current destruction of our forests will lead to serious effects on climate, productivity and life. The forest is gold. If we know how to conserve and manage it well, it will be very valuable"

- Ho Chi Minh 1963, taken from Sterling et al. (2006)

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PART 1: Synopsis

1. Introduction

Over the course of the last four decades, Vietnam has grappled with environmental and social challenges to the development of upland areas of the country. Issues of key importance in this regard have been i) the socio-economic underdevelopment and persistent poverty in ethnic minority communities, ii) deforestation and forest degradation in upland areas, and iii) the social vulnerability of upland areas to shocks, including disasters caused by natural hazards, and iv) the need to increase adaptation to environmental and climate change.

Vietnam remains a largely rural-based agrarian country with only 33.6% of its population, as of 2015, living in urban areas (Bayrak & Marafa 2017). The country has an elongated "S" shape, with a north-to-south length of approximately 1650 km and a total land area of 331,123 km^2 (Jong et al. 2006). The presence of a long coastline and the dependence of a large share of the population on agriculture make Vietnam especially vulnerable to natural hazards and climate change impacts (Rubin 2014, Cullen & Anderson 2016). Future impacts of climate change threaten Vietnam, which is one of the ten countries in the world considered to be most at risk of being affected by sea level rise (Dasgupta et al. 2007). While the Government of Vietnam considers climate change adaptation and mitigation as important national priorities, the geographical focus of efforts has largely been on the heavily populated delta areas and coastal zones. This is despite the fact that Vietnam's mountainous areas are highly affected by natural hazards, such as droughts and severe cold spells (Delisle & Turner 2016).

The uplands are a major topographic feature of Vietnam. Sloping land covers roughly 75% of the country's land area, and the uplands are the home of the majority of Vietnam's ethnic minority populations and most of its forests (Vajpeyi 2001, Vien et al. 2006). Many of these forest-dependent populations are poor, dwelling in isolated and remote locations. Evidence from Northwestern Vietnam showed that ethnic minority groups living in upland areas were found to have less material wealth, lower rates of school attendance, fewer employment opportunities, less market access and, beyond agricultural production, played a very limited role further along the supply chain (Xu et al. 2017). Among the poorest ten percent of the population, the proportion of ethnic minorities has risen to 65 percent (UNDP 2012). These

structural factors continue to play a major role in the social vulnerability of upland populations to natural hazards and climate extremes (Delisle & Turner 2016).

In this dissertation, I seek to enrich the existing body of literature examining the impacts of planned intervention in upland areas of Southeast Asia. It offers a detailed analysis of the dynamics of land use change, access to livelihood resources, social vulnerability to shocks and forest governance mechanisms linked to planned intervention in an upland sub-district in Vietnam. The dissertation examines the vulnerability of households to current and future change processes and how this vulnerability affects various social groups in different ways. The dissertation also shows how changes in forest governance, coupled with market forces, have had both positive and negative consequences for people living in the uplands and the natural resources on which they depend.

The Government of Vietnam has placed a great deal of emphasis on improving the socio-economic situation of people residing in upland areas. As such, it has formulated and implemented several large scale programmes to address poverty in upland and remote areas. In addition to development programmes, the government has also implemented large-scale programmes to address deforestation and forest degradation. Building on these initiatives, the following sections will further examine i) how forests and other forms of land use in the uplands of Vietnam have been managed and the repercussions of these developments, and ii) how upland communities, and ethnic minorities in particular have been perceived by various stakeholders over the years as well as the social and political changes that have been brought to bear on these populations as a result of these perceptions.

1.1. Forests in Vietnam

Forests serve important functions as carbon sinks, pools of genetic resources and as sources of material and spiritual well-being for local communities (Nijnik & Halder 2013). Forests help to stabilize soils and climate, regulate water flows, provide shade and shelter, and provide a habitat for pollinators and the natural predators of agricultural pests (FAO 2016). As a carbon sink, forests play a crucial role in mitigating climate change. Globally, forests absorb 2.4 billion tons of carbon, which constitutes a third of the CO_2 emitted from the burning of fossil fuels (Nijnik & Halder 2013). At the same time, greenhouse gas emissions from the Agriculture, Forestry and Other Land Use (AFOLU) sector constitute almost a quarter of total global greenhouse gas emissions, mainly due to deforestation (IPCC 2014).

Forests and trees help to ensure the food security of hundreds of millions of people as a source of food, energy and income (FAO 2016). Forests provide important products to local communities and are valued as sources of income and the filling of seasonal gaps in food availability, especially in remote areas where opportunities for income-generation and labour are limited (Shepherd & Blockhus 2008). The collection of Non-Wood Forest Products – such as mushrooms, berries, bamboo shoots, ginseng roots, rattan, latex, gums, resins, honey, wild meat, skins and furs – is often highlighted as one of the most important and tangible benefits of forests (FAO 2016, FAO 2017). Furthermore, with over three billion people dependent on traditional biomass for cooking, forests play an important role in providing the energy needed for both cooking and productive uses (IEA 2010). Hence, the conservation of forests is imperative from both environmental and livelihood perspectives.

In Southeast Asia, demographic changes in rural societies and changes in institutional arrangements have contributed to the unsustainable management of ecosystems and the degradation of large areas of forest (Webb & Shivakoti 2008). Prior to 1850, much of Southeast Asia was covered by forests. Over the past century and a half, during both the colonial and post-colonial periods, widespread deforestation occurred, driven primarily by the demand for timber and clearing of land for permanent agriculture (Parnwell & Bryant 1996). Vietnam, up until its independence in 1954, was somewhat of an exception to this trend. While most of the sparsely populated upland forest areas in Vietnam were claimed by the State during the colonial period, the French colonial government had little actual operational control over forest resources, except for certain areas selected for commercial enterprises (Poffenberger 1998). Smith (1954: 110), for example, notes the presence of rubber plantations in the mountainous areas of Đắk Lắk Province in the late 1940s:

> We passed through a great plantation of rubber trees – acres and acres of aisles of straight trees as far as eye could see in every direction, their gray columns of trunks forming a thick, leafy ceiling through which comes only a glimmer of light.

Deforestation rates in Southeast Asia remain high, which endangers numerous endemic forest tree species and increases carbon emissions from deforested peatlands (Miettinen et al. 2011). At the same time, around 500 million people in the region depend on forests for their livelihoods (UNEP 2014). Hence, governments in Southeast Asia have sought to balance economic exploitation with the protection and sustainable use of forests. In order to address these issues, policies for the expansion of forest plantations have been promoted and

promulgated in the region. Globally, forest plantations have expanded at an annual rate of five million hectares over the course of the last six years, with most of the expansion taking place in East Asia (Sikor & Baggio 2014). It is likely that many of these forest areas are monoculture forest plantations intended to supply various industries with rubber, woodchips, palm oil or other products (Lang 2010). Unlike forest plantations, natural forests are highly resilient ecosystems that are well-adapted to perturbations and disturbances. Complex forest ecosystems are more productive in terms of providing goods and services and being more diverse, these forest ecosystems are also more stable. Conversely, forest plantations, with their reduced biodiversity, are more vulnerable to climatic shocks and resulting losses (Thompson et al. 2009).

The forestry sector in Vietnam operates with two main categories of forest – natural and planted. Both natural and planted forests are in turn classified by the Government of Vietnam as being for production, protection or for special use purposes (Jong et al. 2006). Protection forests are considered less environmentally valuable than special-use forests, which are primarily watershed areas in which exploitation is highly restricted (McElwee 2004). As of 2004, forest covered 36.4% of Vietnam's total land area. Of this forest area, 80%.was natural forest and the remainder planted forest (Jong et al. 2006). However, this rigid categorization does not fully convey the tremendous biodiversity that Vietnam possesses, despite many years of war and poverty faced by the country's population. The country's flora is rich and diverse for a country of its size, with more than 10,000 native vascular plant species already known and an estimated 13,000 species in existence (Sterling et al. 2006). Major vegetative formations and forests include lowland evergreen forests, semi-evergreen forests, deciduous dipterocarp forests, savannah woodlands, montane forests, limestone vegetation, mangrove forests and freshwater swamp forests as well as secondary vegetation, including degraded forests and monoculture plantations (Sterling et al. 2006). Some experts have argued that data on forest cover and loss in Vietnam can be misleading, since there are vast regional differences in cover and regional disparities in deforestation (McElwee 2004).

The upland areas contain some of Vietnam's most valuable natural resources, including most of the country's forests (Vien et al. 2006). Before gaining independence from the French in 1954, the upland areas were sparsely populated by ethnic minorities, some of whom practiced various forms of shifting cultivation on higher slopes. Under these conditions, forest management was carried out primarily by traditional governance structures and customary laws (Poffenberger 1998). Smith (1954: 211) makes reference to the traditional farming

practices of the Mnong ethnic minority and the resilience of natural forests in the Central Highlands in the late 1940s:

> The practice of burning the jungle is prohibited, but the natives set fire to the old sun-dried grass near their villages to insure sweet succulent pasture for their cattle and water buffalo later on. The fire usually spreads great distances, burning the dwarf bamboo and grasses. The trees are not destroyed, however. These hard woods seem to have a fire-resisting bark and the sap flows on freely. After the rains, the low blackened bushes and scrub will spring up as green and fresh as ever. These vast forests of hardwood are one of the great natural resources of this country and only the lack of transportation facilities keeps these fortunes in trees untouched.

After 1954, forest management was placed under the purview of State Forest Enterprises (SFEs) while traditional and customary modes of forest management were largely overlooked or ignored. By the late 1980s, however, there was a crisis in the forestry sector, with 10 out of 19 million hectares of forest land classified as barren due to its degraded status (Poffenberger 1998). This was largely the result of a policy of 'State Forestry', with forest management carried out through the SFEs, technical support from the Ministry of Forestry, and an accompanying policy of sedentarization of shifting cultivators (Poffenberger 1998). In the early 1990s, the Government of Vietnam declared that deforestation was the most serious ecological problem facing the country (Parnwell & Bryant 1996), with one of the main drivers of deforestation being the structure and functioning of the SFEs (Jong et al. 2006). Extensive logging bans were implemented in 1993 and codified in 1997, but the bans were poorly enforced and resulted in massive spikes in illegal timber imports from neighbouring countries (McElwee 2004). These events triggered efforts to restructure the SFEs and the implementation of other radical changes to the forestry sector, such as giving local people a greater role in forest management (Webb & Shivakoti 2008).

Recognizing the significant problems of deforestation and forest degradation facing the country, the Government of Vietnam has enacted laws aiming to reverse the significant loss of forest cover which has occurred in the period up until the logging bans in the 1990s. The promotion of forest plantations has been an important part of the government's reforestation agenda since the time of the implementation of the Đổi Mới renovation policies which were a set of economic reforms adopted at the Sixth National Congress of the Communist Party of Vietnam (1986) with the purpose of creating a socialist-oriented market economy in Vietnam.

According to the Center for International Forestry Research (CIFOR), during the 15-year period from 1990 to 2004, the area under natural forests increased by 12% while the area under plantation forests increased by 163% (Jong et al. 2006). The Government of Vietnam has made forest plantations the cornerstone of sustainable forest management policy (Amat et al. 2010). However, a number of studies have identified environmental concerns that have often been overlooked by the apparent success of the forest regeneration in Vietnam. Illegal logging in the high quality natural forests remains a widespread problem (Cochard et al. 2016). As of 2006, 80% of the total forest area in Vietnam was covered by poor quality (<80 $m^{3/}$hectare) natural forest (Jong et al. 2006). Studies have also shown that while the forest cover in Vietnam has increased, deforestation has been displaced, with half the country's wood imports from 1987 to 2006 being illegal (Meyfroidt & Lambin 2009).

Two large-scale national forestry programs, entitled 'Re-greening the Barren Hills Program' (Program 327) and 'The Five Million Hectare Reforestation Program' (Program 661), were implemented in midland- and upland areas of the country in order to encourage replanting and protection of forests, improve land utilization, raise living standards, facilitate poverty reduction, eradicate hunger and prevent soil erosion. It has been estimated that Program 327 was responsible for the successful regeneration of 299,000 hectares of forest and the establishment of new plantations on 397,000 hectares (Jong et al. 2006). It has also been reported that the programme generated 466,678 jobs, built 5,009 kilometres of rural roads, constructed 86,505 m^2 of schools and 16,755 m^2 of medical stations, supported numerous small-scale irrigation projects, and ensured the supply of safe drinking water for over 20,000 households (Jong et al. 2006). However, the programme has been criticized for the top-down manner in which it was implemented, such as imposing the project on poor households without their input, failure to ensure genuine local participation in the land allocation process and promoting deficient silvicultural practices (Jong et al. 2006). The approach taken as well as some of the outcomes of Program 661 have also been criticised. McElwee (2009) found that because the programme promoted plantation forestry rather than natural regeneration, areas of diverse native flora have been replaced by monoculture tree plantations with exotic species. All of these issues can affect the long-term sustainability of the reforestation interventions.

Both reforestation programmes attempted to ensure coherence and synergies with other programmes by targeting areas of the country where infrastructure development, resettlement and sedentarization programmes were being implemented. The reforestation programmes

were also accompanied by major legislative changes in the way land was managed. Two consecutive land laws were passed which have devolved land use rights to local communities and households. Nevertheless, despite massive efforts since the 1990s to reduce deforestation and implement reforestation programmes, Vietnam's total forest area is still relatively small due to clearing of forest for upland crop cultivation (e.g. especially coffee) and hydropower installations (Pham et al. 2013). In 2008, Vietnam became one of the first countries to participate in the UN-led Reducing Emissions from Deforestation and Forest Degradation in Development Countries (REDD) programme. While the UN-REDD programme has yet to be fully implemented at the national level, a number of NGOs have implemented REDD+ projects in the country (Bayrak & Marafa 2017). In 2011, Vietnam introduced a Payment for Forest Environmental Services (PFES) programme and an accompanying fund that allowed households to receive payments in exchange for forest protection activities (Bayrak & Marafa 2017). The PFES programme focuses on four environmental services: watershed protection, protection of the landscape and forest biodiversity for tourism, forest carbon sequestration and use of forests for aquaculture (Pham et al. 2013). The rationale behind the PFES is to create incentives for households and communities to ensure the protection of these environmental services by compensating them for the costs incurred in managing and ensuring the provision of the services (Pham et al. 2013). The vast majority of the payments so far under PFES have been made by hydropower plants (98%) followed by water companies and the tourism sector (Pham et al. 2013). The main achievements of the PFES have been the completion of institutional and organizational arrangements at the provincial level and the generation of USD 85 million over a three-year period, from 2009-2012 (Pham et al. 2013). However, a number of challenges have been identified, such as a low disbursement rate, high transaction costs, failure to ensure legal status for communities to enter into PFES agreements, unclear definition of buyers and suppliers and higher cost burdens for private companies to join PFES schemes (Pham et al. 2013). The PFES is an example of the implementation of a hybrid form of neoliberal environmental policy, in that it incorporates both state and market elements. This has opened up opportunities for local forest stewards to attain a greater role in shaping the implementation of PFES projects (McElwee 2014). In tandem with REDD+ and PFES, Vietnam started negotiations in 2010 with the European Union to enter into the Forest Law Enforcement, Governance and Trade (FLEGT) Facility, the purpose of which is to combat illegal logging and associated illegal trade. In 2017, Vietnam signed a Voluntary Partnership Agreement under the FLEGT, in which the Government of Vietnam agreed to work towards ensuring that all timber and timber products

exported from Vietnam to the EU have been legally produced, thus promoting trade in timber products from sustainably managed forests (European Union 2017). It remains to be seen how and to what degree these initiatives will impact the ethnic minorities and other forest-dependent communities in the uplands of Vietnam.

1.2. The uplands of Vietnam

Since the 1990s, Vietnam has achieved remarkable results – largely attributed to the Đổi Mới policies – in terms of stimulating the economy and reducing poverty (Ravallion & van de Walle 2008). Most of these gains have been achieved in lowland areas, while poverty rates in the uplands remain high (Vien et al. 2006). Significant issues related to land tenure insecurity have persisted in the uplands because of the slow process of issuing land use certificates in these areas (Vajpeyi 2001). The agricultural sector in the uplands of Vietnam faces a number of challenges. The expansion of irrigation in upland areas is often prohibitively expensive (Japan International Cooperation Agency 2013), while deforestation has led to increased runoff, soil erosion and sedimentation in rivers and streams (World Bank 2011).

Many of Vietnam's ethnic minorities dwell in upland areas and are forest-dependent. They are also relatively poor and vulnerable to the impacts of climate change (Bayraf & Marafa 2017). Many scholars have argued that ingrained stereotypes of ethnic minorities being 'backward' and 'uncivilized' persist in Vietnam and that these stereotypes strongly influence government policies related to upland areas (Leisz 2007, Vien et al. 2006, Vien 2003). This view is exemplified by the use of derogatory terms for ethnic minorities. In the 1950s, Smith (1965) notes that – with reference to the Lang Ya ethnic minority group – 'the Vietnamese simply call them "Moi", meaning "barbarians". The use of derogatory terms like *Moi* continues to this day. More recent studies have also presented evidence of State repression of specific ethnic minority groups, particularly in the Central Highlands, which are motivated by evidence of past collaboration with the United States military, religious affiliations and aspirations for self-rule (Vietnam Committee on Human Rights 2012). Over the course of many years, the political control of ethnic minority populations coupled with economic development of upland areas have been key priorities for the Government of Vietnam.

One of the means by which the government has sought to spur socio-economic development in the uplands, along with this population control, has been through the movement of people. The Government of Vietnam has pursued a number of resettlement schemes in order to

develop upland areas, including the resettlement of lowland populations to the uplands and the sedentarization and resettlement of shifting cultivators along with the promotion of tree planting and technologies to increase the productivity of paddy fields and upland crops (Pandey 2006). From the late 1950s to the early 1960s, ethnic minority populations were resettled by the Government of South Vietnam, with support from the United States, under the Strategic Hamlet Program and its predecessor, the Rural Community Development Program, in order to reduce the risk of North Vietnamese infiltration. Smith (1965: 134), in her account of missionary work in the uplands, describes a process whereby

> Thousands of people from this tribe had been brought out of the mountains to resettle in safety here from the Communists, who were continuing to infiltrate all the mountain areas more and more…The Strategic Hamlet Program has brought eight million people in Vietnam into fortified villages. In many tribal areas this has meant that thousands of these mountain people have become accessible to the Gospel overnight.

Further resettlement schemes took place in the late 1960s. The resettlement of shifting cultivators (known as 'Định canh định cư' – the policy to establish fixed cultivation and fixed residence) as well as the redistribution of other groups to reduce pressure on lowland resources from the late 1960s onwards were complemented by another wave of population movements after reunification, where more than two million people were officially resettled (Pandey 2006, Duncan 2008). Policies to resettle shifting cultivators have arguably been pursued as early as 1954 (Scott 2009). While many of these resettlement schemes have been based on environmental rationales – e.g. to deal with supposed ecologically destructive farming practices of shifting cultivators – many such policies were pursued in order to gain greater control over remote areas and over the perceived politically disloyal, destabilizing or threatening populations residing there (Leisz 2007).

Alongside with the targeted resettlement of ethnic minorities, large numbers of Kinh people – the majority ethnic group in Vietnam – have also been resettled. Aside from voluntary migration and resettlement due to war, overpopulation in the delta areas of the country has been one of the main justifications for resettling Kinh people in upland areas. Greater assimilation of minorities through the adoption of lowland farming techniques and exposure to Kinh culture may have also been additional objectives of the policies. For example, Cuc et al. (1996) note Kinh settlers have introduced lowland farming techniques in the uplands, which has had negative environmental consequences, such as soil loss. As of 2003, four to

five million Kinh people were estimated to have moved from lowland areas into the uplands (Luong 2003). While facing the same harsh conditions as ethnic minority populations, the Kinh often have greater access to livelihood resources that enable them to cope with stresses and shocks. For example, in Northwestern Vietnam, Kinh business operators often control the collection of products from agricultural producers in the uplands at district and provincial levels and then maintain connections with export agents (Xu et al. 2017).

The view that the farming practices of ethnic minorities in the uplands are outdated and environmentally destructive has been challenged by a number of scholars. For example, it has been suggested that the Composite Swiddening System practiced by the Da Bac Tay ethnic minority is more environmentally sustainable and more effective in ensuring household food security than more modern farming systems in Vietnam (Vien et al. 2006). It has also been argued that few ethnic minority groups still practice shifting cultivation in its basic form, and that most populations are sedentary and employ farming methods that are extremely well adapted to the difficult environmental conditions found in hilly and mountainous terrain (Vien 2003). Other distinct and resilient ethnic minority farming systems include the 'rock pocket' farming system of the White H'Mong and the rice-cinnamon agroforestry system of the Red Dao (Vien 2003).

In addition to the large-scale reforestation programmes such as Program 327 and Program 661, the Government of Vietnam has implemented major poverty alleviation programs such as Program 135, Program 30A, Program 132, Program 134, the Hunger and Poverty Eradication Program and the National Targeted Program for Poverty Reduction, most of which specifically target ethnic minority populations (UNDP 2012). For example, Program 134, which ended in 2008, provided clean water, land for resettlement, improved housing, and upgraded agricultural land and small-scale irrigation infrastructure for low-income, ethnic minority beneficiaries (USAID 2008). One of the largest programmes, Program 135 was implemented in two phases. Most recently, Phase II was implemented from 2006 to 2010 and targeted the poorest areas of the country with the objectives of reducing the poverty rate to less than 30%, ensuring that more than 70% of households have annual income per capita higher than 3.5 million Vietnamese Dong, improving agricultural yields of the main crops in target areas, increasing the net primary school enrolment rate to at least 95% and increasing the net lower secondary school enrolment rate to at least 75% (UNDP 2012). Research from Thai Nguyen Province shows that the program has been a success in terms of improving access to community health centres and care (Nguyen et al. 2009). Overall, the program has

been praised for utilizing a participatory approach, as indicated by the significant increase in commune-led projects linked to the program (UNDP 2012). However, weaknesses include low capacity of commune officials to implement projects and relatively lower levels of participation of women and ethnic minorities in decision-making as compared with other social groups (UNDP 2012).

As has been presented above, the combination of harsh and vulnerable environmental conditions combined with state policies to exploit the forest and alleviate deforestation have had a major impact on people living in the uplands of Vietnam. Hence, ethnic minority populations in particular have seen their farming systems profoundly affected by policies related to resettlement, land use, land tenure and infrastructure expansion (Ginzburg et al. 2017). This dissertation seeks to shed light on the combined impact of these drivers on the livelihoods of people in a commune in Núi Thành district in the South Central Coast region of Vietnam. It also seeks to improve our understanding of the interaction of social and environmental conditions in the local setting with outside state intervention.

1.3. Objective of the dissertation

The main objective of this dissertation is to examine the ways in which planned intervention and other external drivers of change have engendered livelihood changes and influenced the vulnerability of local people to future stresses and shocks in an upland area of central Vietnam.

In addition, the dissertation assesses the extent to which these planned interventions have achieved the outcomes anticipated by the Government of Vietnam and its donors and partners, and seeks to explain eventual unintended consequences of these interventions.

I pursue this goal by addressing a set of research questions contained within each of the four research papers that form the core of this dissertation. All four papers deal with the effect of various drivers on livelihoods in an upland setting. These drivers include planned interventions, such as programmes for land allocation and reforestation conceived and rolled out by the central government, and natural hazards such as typhoons and drought. By ‘planned intervention’, I refer to any major action taken by the government at any level, line agencies or private actors/entities which significantly affects the livelihoods of households in either a positive or negative way. Examples of planned intervention include programmes to upgrade forest resources, infrastructure or health programmes, resettlement schemes, establishment of cooperatives or the establishment of an economic zone. Following Long

(2001), planned intervention is viewed as 'an ongoing, socially-constructed, negotiated, experiential and meaning-creating process, not simply the execution of an already-specified plan of action with expected behavioural outcomes'. In this sense, the goal of this dissertation is to move beyond simply viewing planned intervention as a top-down process, in which planners have developed an idealized model for the process and instead examine the interactions among participants in the process (Long 2001). Research in development studies has demonstrated that when national programmes are implemented in decentralized settings, the planned activities are often modified by local actors in ways that help them to sustain their livelihoods. These dynamics are highlighted in the four papers that follow.

Paper I traces the history of Vietnamese State intervention at the level of the commune and the capacity of households to adapt to the changes these interventions have brought about. Paper II analyses and compares the impact of land use changes in two communes by focusing on the long-term social and environmental implications of the expansion of household forest plantations and the impact of tropical storms on the forest plantations. Paper III examines how the expansion of forest plantations has reinforced existing inequalities in landholding and discusses the extent to which the increasing gap between wealthy and poor households has implications for vulnerability to natural hazards. Paper IV analyzes how different types of forest land are used and managed by various stakeholders in the context of an increasing demand for wood products and in the absence of formally sanctioned household land use rights.

1.4. List of papers

The PhD dissertation consists of the present synopsis plus the following four papers:

I. Thulstrup, A. W. (2015). Livelihood Resilience and Adaptive Capacity: Tracing Changes in Household Access to Capital in Central Vietnam. *World Development*, 74, 352-362.

II. Thulstrup, A.W., Casse, T., Nielsen, T.T. (2013). The Push for Plantations: Drivers, Rationales and Social Vulnerability in Quang Nam Province, Vietnam. In O. Bruun and T. Casse (Eds.), *On the Frontiers of Climate and Environmental Change*. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 71–89.

III. Thulstrup, A.W. (2014). Plantation Livelihoods in Central Vietnam: Implications for Household Vulnerability and Community Resilience. *Norwegian Journal of Geography*, *68*(1), 1–9.

IV. Thulstrup, A.W. (2017). Linking national forest governance to forest land allocation and reforestation programmes at the local level in a Vietnamese commune. Submitted to the Land Tenure Journal, published by Food and Agriculture Organization of the United Nations.

2. Theory and central concepts

Social vulnerability of households to stresses and shocks is central to the analyses presented in this dissertation. This section presents the concept of social vulnerability, its conceptual origins and how it relates to two other core concepts used in the four papers: livelihoods and resilience.

Studies of vulnerability have a long history, spanning over 70 years, starting with the advent of hazards research in the 1940s (Cutter et al. 2009). This initial body of work sought to identify which actors reside in hazardous zones and the specific 'drivers of vulnerability' to losses from natural hazards. This approach to vulnerability focused on the exposure of people to natural hazards rather than the underlying political and economic challenges that could magnify the impacts of shocks (Cutter et al. 2009). Emphasis was therefore limited to the biophysical vulnerability rather than social vulnerability (Brooks, 2003). Biophysical vulnerability is hazard-centered. It focuses on the type of hazard, the frequency of its occurrence, factors of human exposure and the sensitivity of the system as a whole (Adger et al., 2004; Brooks, 2003). In this definition, human systems are downplayed. To the extent that a social component is included, it mainly serves to exacerbate or mitigate the impact of a hazard. The ability of human systems to cope once a hazard has already occurred is not the focus of analysis (Adger et al., 2004; Brooks, 2003). The measurement of this type of vulnerability is commonly calculated using indicators such as monetary cost to society and mortality (Adger et al., 2004). These indicators are related to the outcome of a hazard event rather than indicators of the conditions prior to a hazard event (Brooks, 2003). Social vulnerability refers to the social units that are most at risk and the degree to which they can be harmed by a hazard event, determined by the properties of a social system or unit such as communities, households, individuals (Adger et al. 2004).

Social vulnerability is itself not a function of the frequency or intensity of a hazard (Adger et al., 2004; Straussfogel 2006). Rather, it is determined by socio-economic factors such as entitlements, adaptive capacity, stability of social institutions, poverty, inequality, health, access to resources and social status (Straussfogel 2006; Adger & Kelly, 1999; Adger et al., 2004; Brooks, 2003). Social vulnerability can be viewed as a determinant of biophysical

vulnerability (Straussfogel, 2006, Brooks, 2003). While it is not a function of the hazard itself, social vulnerability is hazard-specific, in so far as certain properties of the social unit will make it more vulnerable to particular types of hazards (Adger et al. 2004). For the purpose of this dissertation, I will adopt the definition of vulnerability proposed by Wisner et al. (2004; 11):

> By vulnerability we mean the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process).

In this dissertation, I broaden the scope of vulnerability to include any kind of shock, not just natural hazards. The shock could be a severe drought spell but could also be a market shock. The gap in addressing the human drivers of change fostered a new stream of work which emphasized vulnerability not only as a key measure of the exposure of different social actors to episodic changes, e.g. flooding or typhoons, but also highlighted the fact that the relative vulnerability of actors is often determined by their degree of political and ecological marginality (Bryant & Bailey 1997). Broadly speaking, this political ecology approach examines how power relations and structural inequalities are linked to the degradation of the environment, under the premise that the costs and benefits associated with environmental change are not distributed equally and that there are winners and losers in this process (Bryant & Bailey 1997, Robbins 2004, Sovacool 2018). Beyond this, the politicization of environmental issues by governments or other powerful stakeholders can further marginalize the most vulnerable social actors. Forsyth (2003) refers to 'institutionalized, but highly criticized conceptualizations of environmental degradation', which he terms 'environmental orthodoxies'. These conceptualizations refer to flawed or simplistic interpretations of concepts such as desertification, soil erosion and deforestation. For example, the assumption that shifting cultivation is 'of necessity destructive of forests; has low agricultural productivity; and causes a variety of lowland impacts' (ibid.:40) has been challenged by research which shows that there are a multitude of different forms of shifting cultivation systems, some of which include terracing, soil conservation and sustainable forest management practices. It is necessary to look critically at certain scientific narratives which link human activities to ecological change, as they may in some cases serve to justify state control over resources (Peluso 1992; Rangan 1997; Sivaramakrishnan 1999). This type of simplification of environmental change processes has been characteristic of the way the

Government of Vietnam, along with other governments in Southeast Asia, view the farming practices of ethnic minorities. The consequence has been that they have shifted blame for deforestation disproportionally onto these victimized populations. Leach & Mearns (1996), with a case study from Nigeria, used forest plantations as an example of both environmental and social control. In Northern Nigeria, expatriated foresters were convinced that only trees planted in lines and orderly plantations constituted appropriate use of the drylands (Leach & Mearns 1996). The framing of vulnerability derived from a political ecology approach, including a critical view of the simplification of environmental change processes, provide a theoretical underpinning that cuts across all four papers in this dissertation. Similar to the case studies presented by Leach & Mearns (1996), the analysis in this dissertation reveals a relationship between environmental change and people's behaviour in Vietnam that stands in stark contrast with the received wisdom that has guided Vietnam's official land use policies.

Another conceptualization of vulnerability is the framework developed by Turner et al. (2003a). This conceptualization revolves around three central elements: entitlements, coping and resilience. Taken together the three elements determine the level of vulnerability of the systems or social units being analyzed. The tripartite framework places vulnerabilities at the local level within the larger contexts that influence processes often operating at regional to global scales (Cutter et al. 2009). Turner et al.'s framework has been applied to case studies in rural Mexico, where the impact of hurricanes, drought and economic policies is amplified by internal conditions such as local land use decision-making, which may create new hazards (Turner et al., 2003b).

Vulnerability plays a key role in the livelihoods approach (Adger, 2006). The concept of livelihoods – comprising the capabilities, material and social resources and activities required for a means of living (Scoones, 1998) – and the degree to which they are sustainable – is a thread running through all four papers. In Scoones (1998), vulnerability is used to define those individuals and groups who are unable to cope with stresses and shocks in the short term nor adapt over the longer term. These vulnerable groups are thus less likely to achieve sustainable livelihoods (Scoones, 1998). This understanding of vulnerability has its origins in the concept of entitlements, in which 'entitlement failure' is viewed as the root cause of vulnerability to food insecurity (Adger & Kelly, 1999; Adger, 2006). Entitlements are goods and services derived from 'endowments' which are the rights and resources held by social actors (Sikor 2014). Leach et al. (1999) place ecosystem services at the center of an 'environmental entitlements' framework in which endowments, such as access to natural

capital, are mobilized – through the mediation of institutions and organizations – in order to secure entitlements. In such a framework, examples of entitlements include the use of forest products for subsistence purposes or income derived from the sale of cash crops. The vulnerability of an individual, household or community is thus determined by the ability to generate and benefit from entitlements. Social actors can combine and draw upon several types of livelihood resources. Bebbington (1999) highlights the importance of social capital as a crucial endowment because social actors are not able to secure entitlements unless they engage in relationships with other actors. Endowments and entitlements thus enable people to cope with and recover from stresses and shocks, reducing their vulnerability, fostering resilience and creating opportunities for adaptation (Chambers & Conway, 1992; Chambers, 1995; Scoones, 1998). However, the social differentiation of endowments and entitlements also affects the distribution of vulnerability within a community. Vulnerability to shocks such as climate change impacts has both an impact on and is exacerbated by existing inequalities (Adger, 2006), which themselves stem from differential access to livelihood resources.

The concept of adaptation is one of the ways in which vulnerability and resilience are linked. Adaptation to environmental change refers to the adjustments people make in response to current or predicted change. Most adaptation actions are aimed at reducing vulnerability (Nelson et al., 2007). Increasing the capacity to adapt and reducing vulnerability to external and undesirable change are also considered synonymous with enhancing the resilience of people, places and ways of life (Nelson et al., 2007). However, most substantive research on resilience is linked to complex systems theories, rather than research on adaptation to environmental change. The stream of work on social-ecological systems theories bridges the physical and social sciences in order to identify appropriate environmental management strategies (Nelson et al., 2007). Emphasis is placed on the integral link between the actions of human beings and the natural environment and the resources on which they depend (Adger, 2006; Berkes et al., 2003). Furthermore, it has been argued by Berkes et al. (2003) that the complex problems of environmental change and the strong linkages between humans and nature cannot be investigated using traditional mono-disciplinary approaches. In this strand of research, resilience is defined as the capacity of a system to absorb disturbance without losing its basic structure and function, the system's capacity for self-organisation and ability to learn (Nelson et al., 2007; Turner et al., 2003; Klein et al., 2003; Berkes et al., 2003). This definition takes it point of departure from the concept of ecological resilience as defined by Holling (1973): 'a measure of the persistence of systems and their ability to absorb change

and disturbance and still maintain the same relationships between populations and variables'.

Bahadur et al. (2010) note that no definitive operational definition of resilience yet exists. Moreover, the relationship between vulnerability and resilience is contested, with the most commonly articulated distinction being a definition of one as the very opposite of the other. Most conceptualizations of resilience adopt a systems-oriented perspective, which poses methodological challenges for the analysis presented in this dissertation. The four papers in this dissertation draw heavily upon an actor-oriented view, focusing on the agency of social actors, their ability to respond to stresses and shocks, and their ability to reduce vulnerability. Hence, for purpose of analysis, resilience is viewed here as the opposite of social vulnerability. Resilience and vulnerability are a zero-sum game. Households that are less vulnerable to multiple hazards are more resilient. I employ a simple definition of livelihood resilience, derived from Scoones (1998: 6) and amenable to an actor-oriented approach. Resilience is the 'ability of a livelihood to be able to cope with and recover from stresses and shocks'.

3. Methodology

3.1. Research questions

The following seven questions have guided the research for this dissertation:

1. What are the overall outcomes of reforestation programmes implemented in the upland areas of Vietnam?
2. How has the implementation of government programmes affected or altered livelihoods?
3. To what degree have government programmes enabled or constrained the capacity of households to adapt to environmental change?
4. To what extent have forest plantations replaced significant areas of natural forest?
5. What is the rationale for investing in forest plantations, instead of other land uses, and who has benefitted most from their investment?
6. To what extent has the expansion of forest plantations been driven by government policies vis a vis market forces?
7. How do various stakeholders use forest areas in the absence of formally sanctioned land use rights?

The four papers in this dissertation address these seven questions. Taken as a whole, the combined results and conclusions in the papers, address the central objective of the dissertation, which is to show how planned intervention has influenced changes in livelihoods and the vulnerability of local people to future stresses and shocks.

3.2. Research design

The research was structured around the collection and triangulation of secondary data, primary qualitative data and primary quantitative data. The bulk of the data collected was qualitative and derived from a set of household case studies within one sub-district. One location, rather than two or more, was chosen to allow for a comprehensive and in-depth study of the impacts on livelihoods of several external factors including both planned intervention (government programmes) and natural hazards (typhoons and drought).

The field work was carried out in two stages. The first stage, in 2010, comprised a three-month exploratory study focusing on livelihood strategies, exposure to shocks of households in two wards and the overall capacity of commune and district levels of government to respond and support households in the commune. Because the Ketsana typhoon had recently devastated large parts of the district, discussions with government staff focused largely on emergency response and relief efforts. A second field visit, lasting seven months, was carried out in 2011 and involved a more comprehensive study, in all eight wards in the commune, of issues pertaining to vulnerability, social inequality, relations and tension between the two dominant ethnic groups, processes of deforestation and land issues.

In a critique of flawed data collection methods associated with various environmental orthodoxies, Leach and Mearns (1996) emphasize the importance of using historical data such as oral histories, aerial surveys and satellite imagery to study processes of landscape change. They call for more research to be carried out using these methods of data collection and analysis and which pay close attention to the experiences and opinions of local land users. The research presented in this dissertation has focused significantly on the collection of historical data through oral histories and the analysis of satellite imagery to detect changes in forest.

It should be noted that research in the social sciences that focuses on people living in remote areas and ethnic minorities in Vietnam is likely to be met with a certain degree of apprehension and suspicion by locals and officials due to the sensitive nature of the topic.

Foreign researchers who interview local stakeholders at the district- and commune levels, particularly in upland areas, are likely to be closely monitored by the authorities. The need to obtain permissions and related documents from provincial authorities in order to visit remote or upland areas, a common obstacle to fieldwork in most developing countries, will often slow down or complicate the process of data collection. All these challenges have been faced in the process of carrying out this field research. These hurdles have been partly overcome due to the research being linked to a broader Danish-Vietnamese research partnership facilitated by the Danish International Development Agency (Danida).

The approach to collecting and managing land use data by the Government of Vietnam is also worth mentioning. Both the Ministry of Agriculture and Rural Development and the Ministry of Natural Resources and Environment manage databases on land use, and two land use classification systems co-exist (Pham et al., 2012). Furthermore, there is a serious shortage of data on forest degradation (Pham et al., 2012). This complicates efforts to analyse national data and generate credible statistics on the extent and status of forests. Data is collected in a top-down manner, by various government agencies, relying on the responsibility of local officials. Funding for field work at the local level is often limited, and quality is often not assured (Pham et al., 2012), with major implications for both the validity and credibility of national data on forests. The step-wise collection of data – in which information is passed up the chain from the local level (village and commune) to the district and provincial level and then to the central level – makes it vulnerable to political manipulation to suit national agendas and development objectives. Both significant variation and accuracy of data may suffer in the process.

3.3. Field methods and data analysis

Extensive field work and data collection was carried out in Quảng Nam province over the course of 2010-2011 with the support of the Institute of Geography, Vietnam Academy of Science and Technology in Hanoi. Two local assistants accompanied me on two trips to the field. The bulk of my field work was carried out in the commune of Tam Trà, located in Núi Thành district. The comparative study in Paper II also involved data collection in Trà Tân, located in Bắc Trà My, a nearby mountainous district in Quảng Nam.

Prior to initiating the field work, I obtained clearance from the Quảng Nam Department of Foreign Affairs. Obtaining an entry permit required that I provide detailed information about

the aim and purpose of the research, as well as copies of the questionnaires and in-depth interview templates.

While in the field, I conducted household interviews using a snowball sampling method in which sampling, carried out separately in each ward, was terminated once no new information was recorded with additional sampling units (Mikkelsen 2005). Individual interviews were combined with PRA sessions with groups, participant observation, secondary data review, unstructured conversations and key informant interviews in order maximize information and to allow adjustment of contradictory information. Translators were used for these interviews, all of which were conducted in Vietnamese, and extensive notes were taken. These notes were later organized and analysed using NVivo software. Thorough and comprehensive training of translators was carried out prior to initial field trips in order to reduce any risk of losing or misunderstanding important information.

Semi-structured interviews were used to collect data for this dissertation and used to interview both key informants and household members. The semi-structured interview format did not require fixed responses. As such, respondents could elaborate on particular issues that might be of great concern to them. The semi-structured interview is an alternative or supplement to lengthy, large-scale, quantitative questionnaires used in development studies (Mikkelsen 2005). The use of open-ended questions and written or memorized checklists allows unexpected yet relevant issues to be explored. These issues can be followed up using further, probing questions (Mikkelsen 2005).

A total of 40 interviews were carried out in Núi Thành District with members of households in Tam Trà, commune officials in Tam Trà, district government staff and district level forestry department staff. A total of eight interviews were carried out in Bắc Trà My Commune with household members, district- and commune officials. Additional interviews were conducted with government officials and line agency representatives at the provincial level in Quảng Nam. A questionnaire was developed for the comparative analysis in Paper II. The questionnaire was predominantly quantitative, but it also contained a number of open-ended questions that allowed respondents to elaborate on key issues. The questionnaire was used to interview 65 household respondents in both Trà Tân and Tam Trà communes. Finally, an additional 12 life history interviews were also conducted in Tam Trà to trace long-term changes in livelihoods, forest resources and socio-political trends and events. Respondents were asked to divide their lives into periods, with each period bookended by events that had a major impact on the respondent and/or village life.

Participatory Rural Appraisal (PRA) methods were also used to collect data. A total of 24 wealth rankings – three in each of the eight wards – were carried out in Tam Trà, while a total of 12 wealth rankings, three in four wards, were carried out in Trà Tân. Village timelines were elaborated in three wards while cropping calendars, seasonal calendars, Venn diagrams and community mapping sessions were carried out and replicated in two wards in Tam Trà.

Participatory Rural Appraisal (PRA) consists of a set of approaches and methods for the purpose of gaining a comprehensive understanding of the local context and the livelihoods of people and social groups within a particular geographical area (Chambers, 2008). PRA evolved in the late 1980s from Rapid Rural Appraisal (RRA), which encompasses a number of techniques for conducting rapid yet locally grounded data collection in rural areas. Both RRA and PRA have been developed as a compromise between the more common usage of standardized questionnaires by statisticians and economists and the in-depth approach of social anthropologists (Chambers, 2008). The PRA process allows the local people themselves, especially the poor and marginalized, to own the process and map, make diagrams, analyse and act (Chambers 2008). Figures 1 and 2 show the results of some of the PRA sessions conducted in the study area.

There are a number of risks and limitations associated with the use of PRA techniques depending on the scope, purpose and nature of the study being conducted. These risks can be mitigated by ensuring transparency and honesty when interacting with community members and local households. The most common risk is to raise false expectations in the community (Selener et al. 1999). People may expect or assume that money, investments or project interventions will naturally follow after researchers have spent time in a village or community. While PRAs do not guarantee immediate action or results, they help to identify problems and solutions (Selener et al. 1999). Hence, it is very important to clearly state the purpose and aim of the PRA before engaging with the community or individual households. The rapid nature of PRA can also limit the quality and degree of trust established between the researcher and the community. It can result in superficial or even false information being obtained and can fail to identify existing power relations and local political forces. Furthermore, certain social groups may not be well-represented (e.g. women and ethnic minorities). Also, the speed of the PRA can sometimes negatively affect the quality of participation of community members, while in other cases, the community and/or households may simply not be interested in participating (Selener et al. 1999). Group level analysis – which is often the dominant mode in PRA – does not allow for individual perceptions or

interpretations. Conversely, PRAs are usually carried out at the community level, while there is little experience in applying it on a larger scale, such as the province, region or watershed level (Selener et al. 1999). Information is often extracted primarily for the benefit of a researcher or for the researcher's employer rather than for the community (Selener et al. 1999).

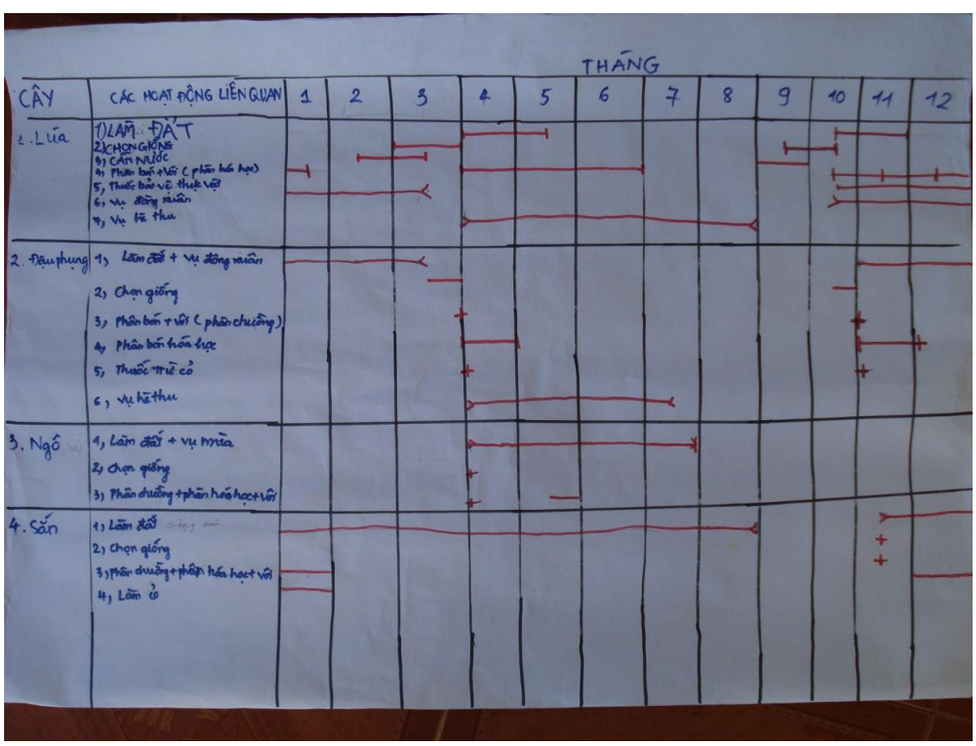

FIGURE 1. CROPPING CALENDAR SHOWING THE SEASONALITY OF ACTIVITIES RELATED TO SPECIFIC CROPS. CALENDAR DEVELOPED BY FOCUS GROUP OF VILLAGERS FROM TAM TRÀ

In order to mitigate some of the above risks and limitations of PRA and other field methods, the following rules of thumb – as noted by Chambers & Gujit (1995) – were taken into account before I started collecting data in the field:

- To ensure that I have professional ethics and personal responsibility when interacting with communities;
- To use a self-critical lens and to always submit my findings for peer review;
- To make certain that social differences at the local level are taken into account in the collection and analysis of data;
- To continuously learn from experiences in the field, both successes and failures.

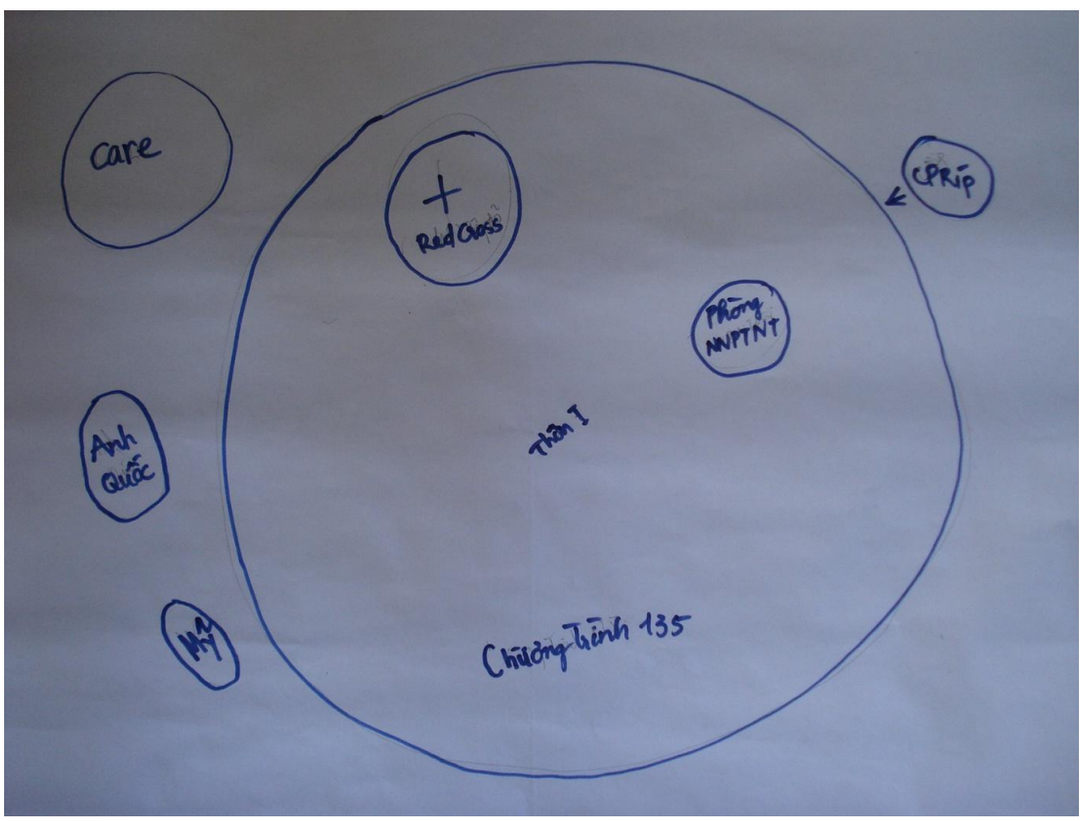

FIGURE 2. VENN DIAGRAM SHOWING THE IMPORTANCE OF VARIOUS ORGANISATIONS AND PROGRAMMES IN THE AFTERMATH OF THE KETSANA TYPHOON. DIAGRAM DEVELOPED BY FOCUS GROUP OF VILLAGERS FROM TAM TRÀ.

The analysis of questionnaires and satellite imagery was carried out jointly with colleagues from Roskilde University. Thorkil Casse from the Department of Society and Globalisation analysed questionnaire data using SPSS software, while Thomas Theis Nielsen from the Department of Environmental, Social and Spatial Change analysed satellite imagery for the purpose of detecting changes in forest cover. Both methodologies are described in detail in Paper II.

The analysis of semi-structured interviews, life histories and data from PRA sessions was conducted using NVivo software. Raw interview data was entered into the NVivo template and coded for various recurring concepts and themes pertaining to the research questions.

3.4. The study area

Field work was mainly carried out in Núi Thành district as well as in Bắc Trà My district in Quảng Nam province. The province is located in the South Central Coast region of Vietnam and covers an area of 10,438 km^2 (Vietnam Government 2009). Quảng Nam was severely

affected by bombing and combat during the Vietnam-American War and was arguably the province with the highest casualty rates in the country during the war, partly due to the fact that large parts of the province were designated as a 'free fire zones' by the Americans (Schell 1968; Appy 2008). Quảng Nam province comprises 16 districts and two cities, Tam Kỳ and Hội An, and has a population of 1,484,300. Out of the total inhabitants, 6.78% belong to ethnic minority groups which include the Co, Co Tu, Xe Dang and Gie Trieng (Dang et al., 2005). Núi Thành district, located in the southeastern part of the province, bordering Quảng Ngãi province, has a population of 142,020 dwelling in an area of 533 km^2 (Vietnam Government, 2009).

Within Núi Thành district, Tam Trà commune is the largest commune. The commune consists of eight wards and covers an area of around 9700 hectares, of which 200 ha is agricultural land and 1000 ha production forest, including household agroforestry systems with *Acacia mangium* and cassava cash crops planted together, as well as monoculture *Acacia mangium* plantations. Figures 3-6 show some of the cropping systems found in the commune.

The remaining area of the commune is part of a 23,409 ha watershed Protection Forest, which is managed by the Phù Ninh Protection Forest Management Board, a local management unit under the purview of the Provincial Forest Protection Department (FPD). Taking into account the large area of land devoted to forest protection, Tam Trà commune is both the geographically largest and the least populated commune in the district. The total population in 2008 was 2886 people. Three wards are inhabited predominantly by Co households, and the remaining five are inhabited by Kinh households.

According to accounts shared by villagers, the forests were dense in the late 1970s and early 1980s when the commune was established and only a small path ran through the current commune area. Many years would pass before the commune was provided with proper roads and access to electricity. Roads were significantly improved when Program 135 was implemented after 2000, and most commune residents have had electricity since 2006. However, several formerly abundant tree species have been exploited to the brink of extinction. These species served a range of purposes and provided a number of products for households. At least five species of rattan (Vietnamese: *Mây*) – mainly *Calamus spp.* from the *Arecaceae* family – were used as building materials, for provision of food, for making handicrafts, as a source of oil and for medicinal purposes. These species include the following locally-named *Calamus spp.*: *Mây Trà Phun, Mây con, Mây cau* and *Mây sông mật*

as well as *Mây nước* (*Flagellaria indica*). Rattan has now been overexploited, and villagers are forced to travel long distances in order to find it in sufficient amounts.

Fruit trees such as *mít rừng* (*Artocarpus spp.* from the *Morace* family, locally known as wild jackfruit) and *chuối rừng* (*Musa acuminate* from the *Musace* family, a species of forest/wild banana) were important sources of food in the early days. The former is now very rarely found in the commune. A number of other tree species were abundant during the establishment of the commune in the period from 1975-1979. These include *Sầu đâu* (*Azadirachta indica* from the *Meliac* family) which is used for medicinal purposes and as timber and *Sơn đào* (*Melanorrhoea usitata*), also used as timber and in the production of bioplastic. Other tree species and their uses are detailed further in Paper I. Many of these trees were overexploited and used to make furniture or to build houses, while a large amount was also sold as commercial timber. For example, roof beams are sometimes made of valuable *Húynh* and *Sên* wood.

These trees have been of great importance to both Kinh and Co households, both of which have played a role in their exploitation. The Co, a small ethnic minority group residing only in Vietnam, currently with a total population of about 28,000, are now concentrated in the Trà Bồng and Sơn Hà districts in Quảng Ngãi and in the Bắc Trà My and Nam Trà My districts in Quảng Nam (Dang et al., 2010). Smith (1965) describes visiting Bồng Miêu in the 1950s, currently located in Phú Ninh district, about 20 km from Tam Trà, and observing the longhouses in which they lived with a length of roughly 70-80 meters and situated on stilts (Smith, 1965, Dang et al., 2010). In her visit to a Co village, Smith describes the rooms inside a Co house as being small, dark and smoky due to the presence of cooking fires burning in rudimentary mud stoves (Smith, 1965). Since the year 2000, coinciding with the implementation of Program 135, the Co have been building modern houses at ground level (Dang et al., 2010).

Traditional practices of the Co include singing, playing gongs and drums, the sacrifice of buffalos as well as storytelling (Dang et al., 2010). Gongs are generally played in sets of three accompanied by drums (Dang et al., 2010). The Co are described as the ‘Blue Bead People’ due to the tiered blue bead necklaces and bracelets (Smith, 1965). In the past, the Co would sell and barter cinnamon and green tea leaves with the lowland Kinh people (Smith, 1965). Smith (1965: 41) describes viewing piles of cinnamon bark at a trading post and observing the Co who carry ‘huge loads on their backs, from their trees up in the mountains’. She also

notes that the Co catch fish in the river, hunt with traps and arrows, cultivate crops on the slopes and keep chickens and pigs under the longhouses (Smith, 1965). The Co are described in the 1950s as being able to speak and, in some cases, read and write Vietnamese quite well (Smith, 1965), unlike other ethnic minority groups, and this is likely due to frequent interaction through trade relations.

The three Co hamlets were established in 1975 in order to resettle the ethnic minority population and encourage them to cultivate wet rice. This was the result of the government policy of 'Fixed Cultivation and Sedentarisation' which targeted shifting cultivators. Their practice of planting upland rice in a swidden farming system was gradually replaced by wet-rice systems. A few years later, the establishment of the Phú Ninh reservoir in the neighbouring Phú Ninh district necessitated the resettlement of several Kinh communities to what would become the five other wards in Tam Trà in 1979. Paper IV provides a more detailed account of the establishment of the commune.

Trà Tân, in which data was collected for Paper II, is one of the 12 communes in the district of Bac Tra My.[1] The 12 communes are classified according to their elevation above sea level as high, medium or low elevation. *Acacia* spp. trees are planted in communes in the low and medium elevation zones, while the high elevation communes are planted mainly with rubber trees (*Hevea brasiliensis*), which have largely replaced cinnamon (*Cinnamomum* spp.) as a major cash crop.

Crop cultivation in the district is focused mainly on cassava, peanut, maize, paddy rice and upland rice. The district is ethnically diverse, with 58% of the population being Kinh while 42% are ethnic minorities. These minorities include the indigenous Co, Ca Đong, and Xè Đăng, and the M'Nong, a more recent settler group. The total district population in Bac Tra My is 39.210 people, divided into 7762 households. There are eight wards in Trà Tân with two main ethnic groups: the Kinh and the Ca Dong. Each ward contains sub-wards called *cum dân cư*, which are ethnically homogenous. However, both Kinh and Ca Dong people in

[1] Bắc Trà My district was established in 1947 as Chau Trà My. In 2003 the district was divided into two new districts: Nam Trà My and Bac Trà My.

FIGURE 3. CASSAVA PLOT IN TAM TRÀ. PHOTO BY THE AUTHOR.

FIGURE 4. WET RICE PLOTS IN TAM TRÀ. PHOTO BY THE AUTHOR.

FIGURE 5. FOREST PLANTATION PLOT BEING BURNED BEFORE PLANTING IN TAM TRÀ. PHOTO BY THE AUTHOR.

FIGURE 6. FOREST PLANTATION WITH ACACIA TREES IN TAM TRÀ. PHOTO BY THE AUTHOR

the area can speak each other's languages. A few other households belong to other ethnic groups. The commune was established in 1979. Most of the inhabitants were local, although some people had migrated from Tam Ky. The main agricultural crops cultivated in the commune were paddy rice, peanut and a relatively smaller area devoted to upland rice. Upland rice cultivation has been limited by the government in order to prevent deforestation. Less prevalent crops include sweet potato, maize and cassava. Trees include *Acacia* spp, cinnamon and orange trees, although cinnamon is no longer economically feasible for income

generation, while soils are no longer suitable for orange. The wards are more or less equally poor. Around 50% of the households in each ward are classified as poor according to the government classification system.

4. Conclusion

In this dissertation, I have sought to analyse the ways in which state interventions have altered the livelihoods of local people and which social actors have proven themselves to be less vulnerable and more resilient in dealing with a complex history of responding to multiple stress and shock factors.

The implementation of large-scale national programmes, described above and in the four papers, has had a number of unintended consequences that have left parts of the population increasingly vulnerable to both market forces and natural hazards. These consequences include the reinforcement of existing social inequality, uncontrolled extraction of valuable tree species, the replacement of natural forest with production forest and the poorest households' increasing dependence on casual labour as a short-term and unstable source of income. Many households continue to rely on agriculture for the bulk of their income, but recurring droughts, poor soils and lack of investment have left them vulnerable and unable to claim forest land, since most of the land has already been acquired. Those who have invested in production forestry early on have benefitted immensely and have been able to consolidate forest land by purchasing additional land, often from ethnic minority households. These 'early investor' households are more resilient in the face of change, given that they have more diversified livelihood portfolios, often owning small businesses or acting as middlemen in wood supply chains.

Despite the ability of some households to diversify their livelihoods, most are in some way engaged at various stages of the wood supply chain. From a resilience perspective, this is problematic, since the lack of diverse income sources will leave households unable to absorb a market shock or a natural hazard.

Despite making strides towards devolution and greater participation, people in the study area have been guided overwhelmingly in their decision-making by the government, which has used a technocratic and top-down approach. In the study area, this has arguably been at the expense of full transparency and the genuine involvement of the people who are directly affected by these interventions. This has also brought out particular ways of interpreting requests handed down by higher levels of government and allowed local people to devise

innovative strategies for bending or breaking the rules in order to ensure their food security and a decent level of well-being.

It is my conviction that the research in this dissertation has shed new light on the historical events and processes that have shaped the social vulnerability of various actors and their livelihood strategies. In these papers, I show how the data collection methods and analysis have enabled me to produce research that is valid and credible despite challenges – described earlier – pertaining to the use of official national statistics and the constraints on carrying out interdisciplinary social science research in a geographical and institutional setting that generally favors mono-disciplinary and natural science approaches.

In order to achieve the objective, the dissertation has also successfully sought to revitalize the use of the sustainable livelihoods approach and to apply concepts such as social vulnerability and resilience to that endeavor. Finally, the dissertation has focused on a geographical area, i.e. the uplands of central Vietnam, which continues to be overlooked in research on natural hazards, climate change adaptation and land tenure.

References

Adger, W. N. (2000). Social and ecological resilience: Are they related? *Progress in Human Geography*, *24*(3), 347-364.

Adger, W. N. (2006). Vulnerability. *Global Environmental Change*, *16*(3), 268-281.

Adger, W. N., & Kelly, P. M. (1999). *Assessing vulnerability to climate change and facilitating adaptation*. CSERGE GEC Working Paper No. 7 (GEC 99-07). Norwich, UK: Centre for Social and Economic Research on the Global Environment, University of East Anglia.

Adger, W. N., Brooks, N., Bentham, G., Agnew, M., & Eriksen, S. (2004). *New indicators of vulnerability and adaptive capacity*. Norwich, UK: Tyndall Centre for Climate Change Research.

Agrawal, A. (2005). *Environmentality: Technologies of Government and the Making of Subjects.* Durham, NC: Duke University Press.

Amat, J. P., Tuu, B. P., Robert, A., & Huu, N. T. (2010). Can fast growing species form high-quality forests in Vietnam, examples in Thù'a Thiên-Huê province. *Bois et forêts des tropiques*, 305, 3.

Appy, C. G. (2008). *Vietnam: The definitive oral history told from all sides* (1st ed.). Great Britain: Ebury Press.

Bahadur, A. V., Ibrahim, M., & Tanner, T. (2010). *The resilience renaissance? Unpacking of resilience for tackling climate change and disasters.* Brighton: Institute of Development Studies.

Bayrak, M.M., Marafa, L.M. Livelihood Implications and Perceptions of Large Scale Investment in Natural Resources for Conservation and Carbon Sequestration: Empirical Evidence from REDD+ in Vietnam. (2017). *Sustainability* (Switzerland), *9*(10), art. no. 1802.

Berkes, F., Colding, J., & Folke, C. (Eds.). (2003). *Navigating social-ecological systems: Building resilience for complexity and change* (1st ed.). Cambridge, UK: Cambridge University Press.

Blaikie, P., & Brookfield, H. (1987). *Land degradation and society* (1st ed.). London and New York: Methuen.

Brooks, N. (2003). *Vulnerability, risk and adaptation: A conceptual framework.* Tyndall Centre for Climate Change Research Working *Paper*, 38, 1-16.

Bryant, R. L., & Bailey, S. (1997). *Third world political ecology* (1st ed.). New York, New York: Routledge.

Chambers, R. (1995). Poverty and livelihoods: Whose reality counts? *Environment and Urbanization*, *7*(1), 173-204.

Chambers, R. 1994. The origins and practice of participatory rural appraisal. *World Development*, *22*, 953–969.

Chambers, R. 2008. *Revolutions in development inquiry*. London: Earthscan.

Chambers, R., & Conway, G. R. (1992). *Sustainable rural livelihoods: Practical concepts for the 21st century.* IDS Discussion Paper, 296

Chambers, R., & Gujit, R. (1995, April). PRA - five years later. where are we now? *Forests, Trees and People Newsletter*, 26/27, 4-14.

Cochard, R., Ngo, D. T., Waeber, P. O., & Kull, C. A. (2016). Extent and causes of forest cover changes in Vietnam's provinces 1993–2013: A review and analysis of official data. *Environmental Reviews*, (999), 1-19.

Cuc, L.T., A.T. Rambo, K. Fahrney, T.D. Vien, J. Romm and T.S. Dang (eds) (1996), Red Books, Green Hills: The Impact of Economic Reform on Restoration Ecology in the Midlands of Northern Vietnam. Honolulu: East West Centre Programme on the Environment.

Cullen, A. C. and Anderson, C. L. (2017), Perception of climate risk among rural farmers in Vietnam: consistency within households and with the empirical record. *Risk Analysis*, *37*, 531–545.

Cutter, S. L., Emrich, C., Webb, J. J. and Morath, D. (2009). *Social vulnerability to climate variability hazards: A review of the literature. Final report to Oxfam America.* Hazard and vulnerability research institute, University of South Carolina.

Duncan, C. R. (Ed.). (2008). *Civilizing the margins: Southeast Asian government policies for the development of minorities.* NUS Press.

Dang, N., Chu, T. S., & Luu, H. (2005). *The Ethnic Minorities in Vietnam.* Foreign Languages Publishing House.

Dasgupta, S., Laplante, B., Meisner, C., Wheeler, D., Yan, J. (2009).The impact of sea level rise on developing countries: A comparative analysis. *Climatic Change*, *93*, 379-388.

Davis, D. (2005) Indigenous knowledge and the desertification debate: Problematizing expert knowledge in North Africa, *Geoforum, 36,* 509-24.

Delisle, S., and Turner, S. (2016) 'The weather is like the game we play': Coping and adaptation strategies for extreme weather events among ethnic minority groups in upland northern Vietnam. *Asia Pacific Viewpoint*, *57*, 351–364.

Fairhead, J., & Leach, M. (1996). *Misreading the african landscape: Society and ecology in a forest-savanna mosaic*. Cambridge: Cambridge University Press.

Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C. S., & Walker, B. (2002). Resilience and sustainable development: Building adaptive capacity in a world of transformations. *Ambio*, *31*, 437-440.

Forsyth, T. (2003). *Critical political ecology: The politics of environmental science.* London: Routledge.

Forsyth, T. (2010). Politicizing environmental explanations. in: Goldman, M. Nadasdy, P. and Turner, M. (Eds) *Knowing Nature, Transforming Ecologies: Science, Power, and Practice in Environmental Science and Management,* Chicago: University of Chicago Press.

European Union. (2017). *Voluntary Partnership Agreement between the European Union and the Socialist Republic of Viet Nam on Forest Law Enforcement, Governance and Trade.* Barcelona: EU-FLEGT Facility.

Grandin, B. E. (1988). *Wealth ranking in smallholder communities: A field manual.* Intermediate Technology Publications.

Gunderson, L. H. (2000). Ecological resilience - in theory and application. *Annual Review of Ecology and Systematics*, *31*, 425-439.

Hill, C., Thuy, P.T.N., Storey, J., Vongphosy, S. (2017). Lessons learnt from gender impact assessments of hydropower projects in Laos and Vietnam. *Gender and Development*, *25*, 455-470.

Holling, C. S. (1973). Resilience and stability of ecological systems. Annual review of ecology and systematics, 4(1), 1-23.

IEA. 2010. *World Energy Outlook.* Paris: International Energy Agency.

(available at www.worldenergyoutlook.org/media/weo2010.pdf).

Japan International Cooperation Agency. (2013). *Agricultural Transformation & Food Security 2040. ASEAN Region with a Focus on Vietnam, Indonesia, and Philippines: Vietnam Country Report.* JICA. Tokyo.

Jong, W. d., Sam, D. D., & Hung, T. V. (2006). *Forest rehabilitation in Vietnam: histories, realities and future.* Jakarta: CIFOR.

Lang, C. (2010). Monocultures on the march. *WRM Bulletin* 138. World Rainforest Movement. Montevideo.

Available at: https://chrislang.org/2010/09/19/monocultures-on-the-march-in-southeast-asia/

Leach, M. & Mearns, R. (1996). *The lie of the land: Challenging received wisdom on the African environment.* London: The International African Institute.

Leisz, S (2007). *Reinterpreting the Uplands of Vietnam: Towards Understanding and Correcting a Misreading of its Land Cover, Land Use, and Resource Management Systems.* PhD Dissertation, University of Copenhagen.

Long, N. (2001). *Development sociology: Actor perspectives.* London: Routledge.

Luong, H. V. (Ed.). (2003). *Postwar Vietnam: Dynamics of a transforming society.* London: Rowman & Littlefield.

McElwee, P. (2004). You say illegal, I say legal: The relationship between 'illegal'logging and land tenure, poverty, and forest use rights in Vietnam. *Journal of Sustainable Forestry, 19*, 97-135.

McElwee, P. (2009). Reforesting 'bare hills' in Vietnam: Social and environmental consequences of the 5 million hectare reforestation program. *Ambio: A Journal of the Human Environment*, *38*, 325-333.

McElwee, P., Nghiem, T., Le, H., Vu, H., & Tran, N. (2014). Payments for environmental services and contested neoliberalisation in developing countries: A case study from Vietnam. *Journal of Rural Studies*, *36*, 423-440.

Meyfroidt, P., & Lambin, E. F. (2009). Forest transition in Vietnam and displacement of deforestation abroad. *Proceedings of the National Academy of Sciences*, *106*, 16139-16144.

Miettinen, J., C. Shi, and S.C. Liew, 2011a: Deforestation rates in insular Southeast Asia between 2000 and 2010. *Global Change Biology*, *17*, 2261-2270.

Mikkelsen, B. (2005). *Methods for development work and research* (2nd ed.). London: Sage Publications.

Nelson, D. R., Adger, W. N., & Brown, K. (2007). Adaptation to environmental change: Contributions of a resilience framework. *Annual Review of Environment and Resources*, *32*, 395-419.

Nijnik, M., & Halder, P. (2013). Afforestation and reforestation projects in South and South-east Asia under the clean development mechanism: Trends and development opportunities. *Land Use Policy*, *31*, 504-515.

Nguyen, P., Bich Hanh, D., Lavergne, M.R., Mai, T., Nguyen, Q., Phillips, J.F., Hughes, J., Van Thuc, H. (2010). The effect of a poverty reduction policy and service quality standards on commune-level primary health care utilization in Thai Nguyen Province, Vietnam. *Health Policy and Planning*, *25*, 262-271.

Pandey, S. (2006). *Upland rice, household food security, and commercialization of upland agriculture in Vietnam*. International Rice Research Institute. Los Banos.

Peluso, N. L. 1992. *Rich forests, poor people: resource control and resistance in Java.* Berkeley, CA: University of California Press.

Poffenberger, M. (Ed.). (1998). Stewards of Vietnam's upland forests: a collaborative study by the Asia Forest Network and the Forest Inventory and Planning Institute. (Research Network Report No. 10, January). Berkeley: Asia Forest Network.

Rangan, H. 1997: Property vs. control: the state and forest management in the Indian Himalaya. *Development and Change, 28*, 71-94.

Ravallion, M., & van de Walle, D. (2008). *Land in transition: Reform and poverty in rural Vietnam* (1st ed.). Washington, DC: The World Bank and Palgrave Macmillan.

Robbins, P. (2004) *Political ecology: A critical introduction*. Oxford: Wiley-Blackwell.

Rubin, O. (2014), Social vulnerability to climate-induced natural disasters: Cross-provincial evidence from Vietnam. *Asia Pac Viewp*, *55*, 67–80.

Schell, J. (1968). *The military half* (1st ed.). New York: Alfred A. Knopf, Inc.

Scoones, I. (1998). *Sustainable rural livelihoods: A framework for analysis.* Institute of Development Studies, (IDS Working Paper 72)

Scoones, I. (2009). Livelihoods perspectives and rural development. *The Journal of Peasant Studies, 36*, 171-196.

Scott, J. C. (2009). *The art of not being governed: An anarchist history of upland Southeast Asia* (1st ed.). New Haven: Yale University Press.

Selener, D., Endara, N., & Carvajal, J. (1999). *Participatory rural appraisal and planning workbook.* Silang: International Institute for Rural Reconstruction.

Shepherd, G., Blockhus, J., (with contributions from experts from CIFOR, IUCN, ODI, PROFOR, Winrock International and the World Bank) (2008). PROFOR Poverty-Forests Linkages Toolkit.

Sikor, T. and Baggio, J.A. (2014). Can smallholders engage in tree plantations? An entitlements analysis from Vietnam. *World Development*, *64,* (S1) S101–S112.

Sivaramakrishnan, K. 1999. *Modern forests: statemaking and environmental change in colonial Eastern India.* Stanford: Stanford University Press.

Sovacool, B.K. (2018). Bamboo beating bandits: conflict, inequality, and vulnerability in the political ecology of climate change adaptation in Bangladesh. *World Development*, 102, 183-194.

Stott, P., & Sullivan, S. (Eds.). (2000). *Political ecology: Science, myth and power* (1st ed.). London: Arnold.

Straussfogel, D. (2006). Exploring the theoretical interface of climate change and resource dependency: Application to the vulnerability of boreal forest regions. *Mitigation and Adaptation Strategies for Global Change*, *11*, 911-931.

Thompson, I., Mackey, B., McNulty, S., Mosseler, A. (2009). *Forest Resilience, Biodiversity, and Climate Change. A synthesis of the biodiversity/resilience/stability relationship in forest ecosystems.* Montreal: Secretariat of the Convention on Biological Diversity. Technical Series no. 43.

Turner, B. L., Kasperson, R. E., Matson, P. A., McCarthy, J. J., Corell, R. W., Christensen, L.,. & Polsky, C. (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences*, *100*, 8074-8079.

Turner, B. L., Matson, P. A., McCarthy, J. J., Corell, R. W., Christensen, L., Eckley, N., & Martello, M. L. (2003). Illustrating the coupled human–environment system for vulnerability analysis: Three case studies. *Proceedings of the National Academy of Sciences*, *100*, 8080-8085.

United Nations Development Programme (UNDP). (2012). *Impact of Program 135 phase II through the lens of baseline and endline surveys.* Hanoi: UNDP.

United Nations Environment Programme (UNEP). (2013). *Building inclusive green economies: success stories from south-south cooperation*. Nairobi: UNEP.

United States Agency for International Development (USAID). (2008). *Vietnam Central Highlands Needs Assessment: Final Report*. Washington, D.C.: USAID.

Vajpeyi, D.K. (2001). *Deforestation, environment, and sustainable development: a comparative analysis.* Westport, CT: Praeger.

Vien, T. D. 2003. Culture, environment, and farming systems in Vietnam's northern mountain region. *Southeast Asian Studies, 41*, 180–205.

Vien, T. D., Leisz, S. J., Lam, N. T., & Rambo, A. T. (2006). Using traditional swidden agriculture to enhance rural livelihoods in Vietnam's uplands. *Mountain Research and Development*, *26*, 192-196.

Vietnam Committee on Human Rights. (2012). *Violations of the rights of ethnic and religious minorities in the Socialist Republic of Vietnam: alternative report on the implementation of the UN International Convention on the Elimination of All Forms of Racial Discrimination (ICERD)*. Boissy Saint Léger cedex: Vietnam Committee on Human Rights.

Walker, B., & Salt, D. (2006). Resilience thinking: Sustaining ecosystems and people in a changing world. Retrieved from http://www.resalliance.org/2963.php.

Webb, E. L., & Shivakoti, G. (Eds.). (2008). *Decentralization, forests and rural communities: policy outcomes in Southeast Asia.* Thousand Oaks, CA: SAGE Publications.

Wischmeier, W.H., Smith, D.D. (1978). *Predicting rainfall erosion losses*, Agricultural Handbook 537, USDA. Washington, D.C.: U.S. Department of Agriculture.

Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2003). *At risk: natural hazards, people's vulnerability and disasters* (2nd ed.). New York: Routledge.

World Bank. (2011). *Vietnam development report 2011: natural resources management. joint development partner report to the Vietnam consultative group meeting Hanoi, December 7-8, 2010.* Hanoi: World Bank.

Xu, J., McLellan, T., & Hiwasaki, L. (2017). Integrating swidden agricultural knowledge systems. In M. Cairns (Ed.), *Shifting cultivation policies: balancing environmental and social sustainability.* Boston, MA: CABI.